Lantech

# IPES/IES-5416DF

# IPES/IES-5216DF

# Series

**16 10/100TX + 4 or 2 100/1000FX Dual Speed Fiber L2+ (w/ PoE at/af) EN50155 Managed Ethernet Switch**

## User Manual (Hardware)

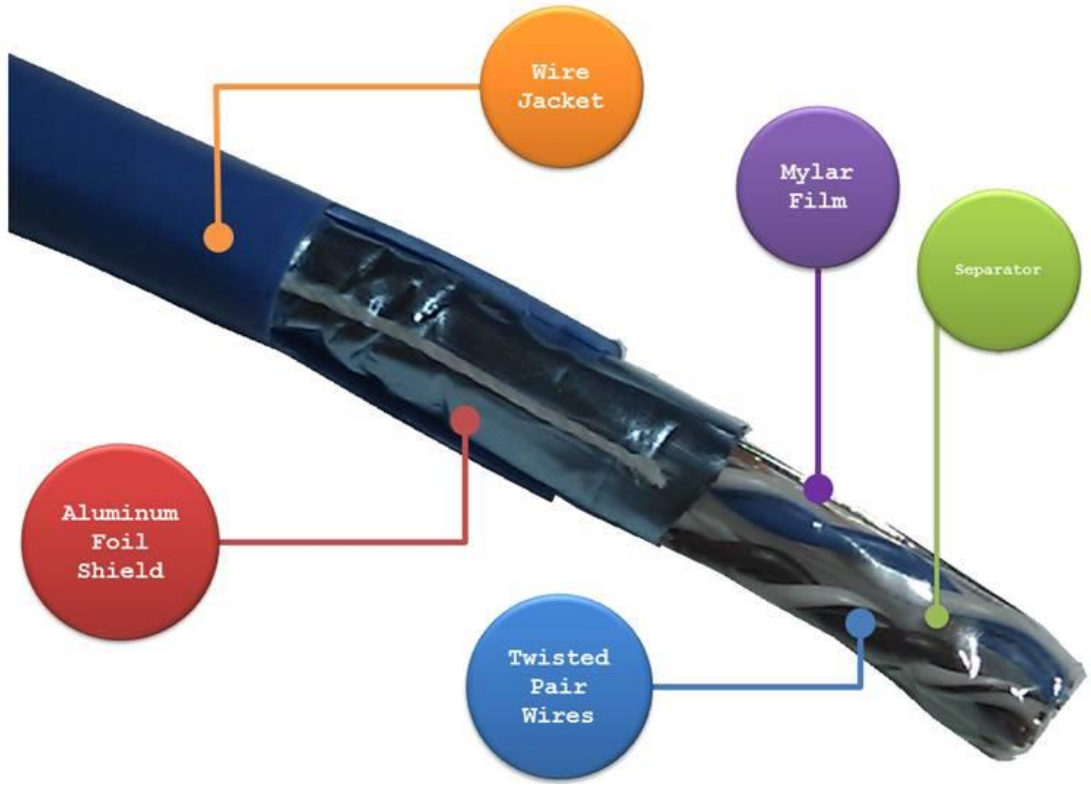
IP-67

IP-54

Apr 2019

# Recommendation for Shielded network cables

STP cables have additional shielding material that is used to reduce external interference. The shield also reduces the emission at any point in the path of the cable. Our recommendation is to deploy an STP network cable in demanding electrical environments. Examples of demanding indoor environments are where the network cable is located in parallel with electrical mains supply cables or where large inductive loads such as motors or contactors are in close vicinity to the camera or its cable. It is also mandatory to use an STP cable where the power device (like IP camera) is used outdoors or where the network cable is routed outdoors.



# Important Notice

Lantech Communications Global, Inc. reserves the right to modify the equipment, its specification or this manual without prior notice, in the interest of improving performance, reliability, or servicing. At the time of publication all data is correct for the operation of the equipment at the voltage and/or temperature referred to. Performance *d*ata indicates typical values related to the particular product.

No part of this documentation or information supplied may be divulged to any third party without the express written consent of Lantech Communications Global Inc. Products offered may contain software which is proprietary to Lantech Communications Global Inc. The offer or supply of these products and services does not include or infer any transfer of ownership.

# Interference Issues

This Equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a commercial or industrial installation. This equipment generates, uses, and can radiate radio frequency energy. It may cause harmful interference to radio communications if the equipment is not installed and used in accordance with the instructions.

# FCC Warning

This Equipment has been tested and found to comply with the limits for a Class-A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy. It may cause harmful interference to radio communications if the equipment is not installed and used in accordance with the instructions. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

# CE Mark Warning

This is a Class-A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

# Content

# Chapter 1 Introduction

**Model Description**

| | |
|---|---|
| IPES-5416DF series | 16 10/100TX PoE at/af + 4 Dual Speed Fiber L2+ EN50155 Managed IP67/IP54 Ethernet Switch w/ 8 or 16 PoE at/af |
| IPES-5216DF series | 16 10/100TX PoE at/af + 2 Dual Speed Fiber L2+ EN50155 Managed IP67/IP54 Ethernet Switch w/ 8 or 16 PoE at/af |
| IES-5416DF series | 16 10/100TX PoE at/af + 4 Dual Speed Fiber L2+ EN50155 Managed IP67/IP54 Ethernet Switch |
| IES-5216DF series | 16 10/100TX PoE at/af + 2 Dual Speed Fiber L2+ EN50155 Managed IP67/IP54 Ethernet Switch |

# Chapter 2 Hardware Description

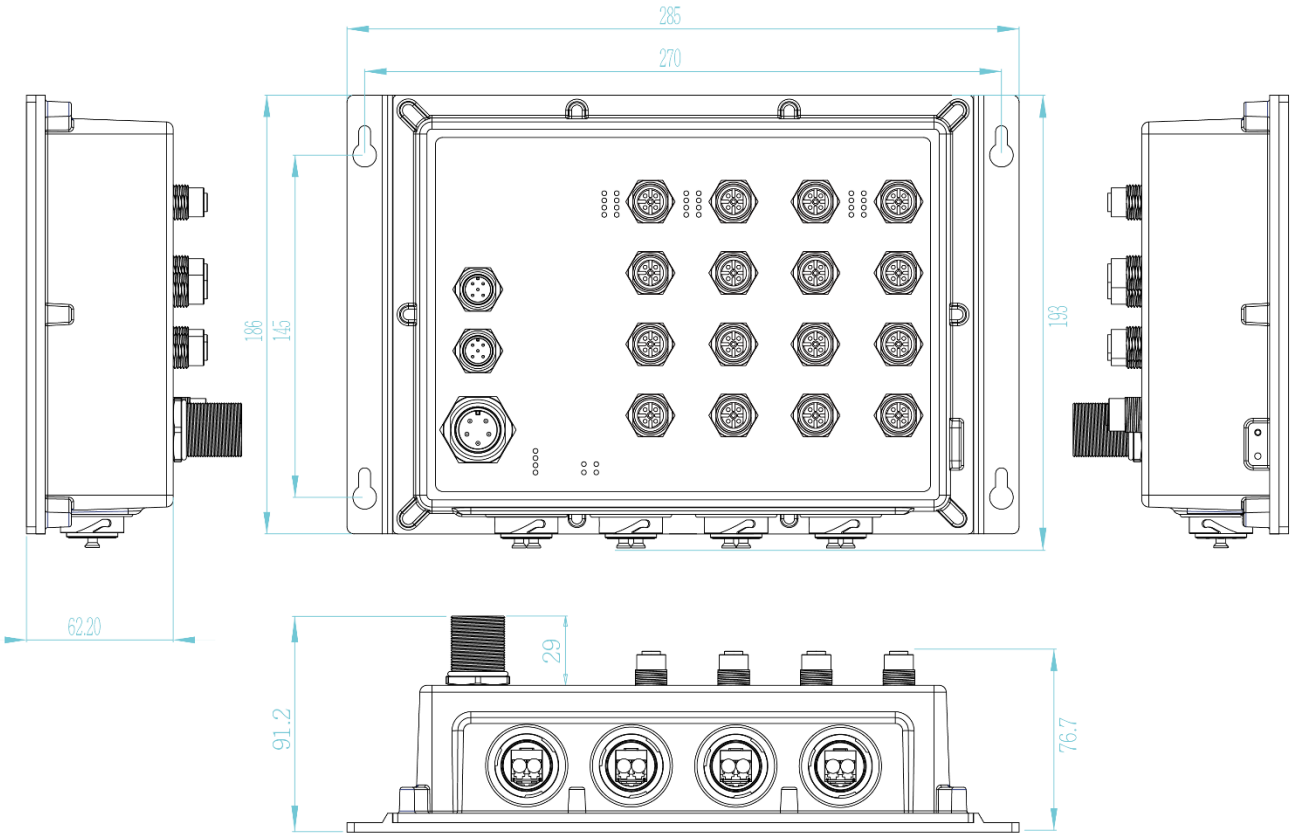
In this paragraph, it will describe the Industrial switch's hardware spec, port, cabling information, and wiring installation.

## 2.1 Physical Dimension

**IPES-5416DF**

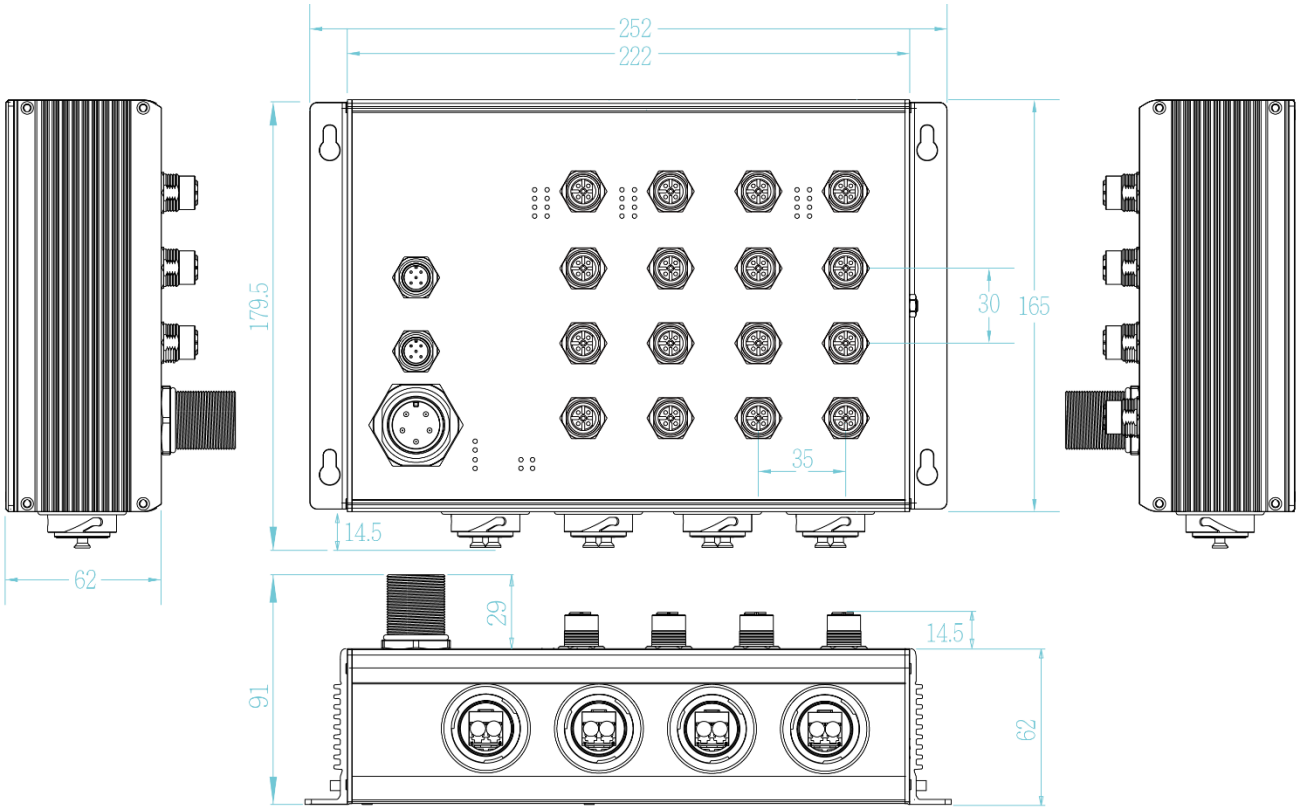
Aluminum case. IP-67,

285 (W) x 193 (D) x 91.2 (H) mm




Aluminum case. IP-54,

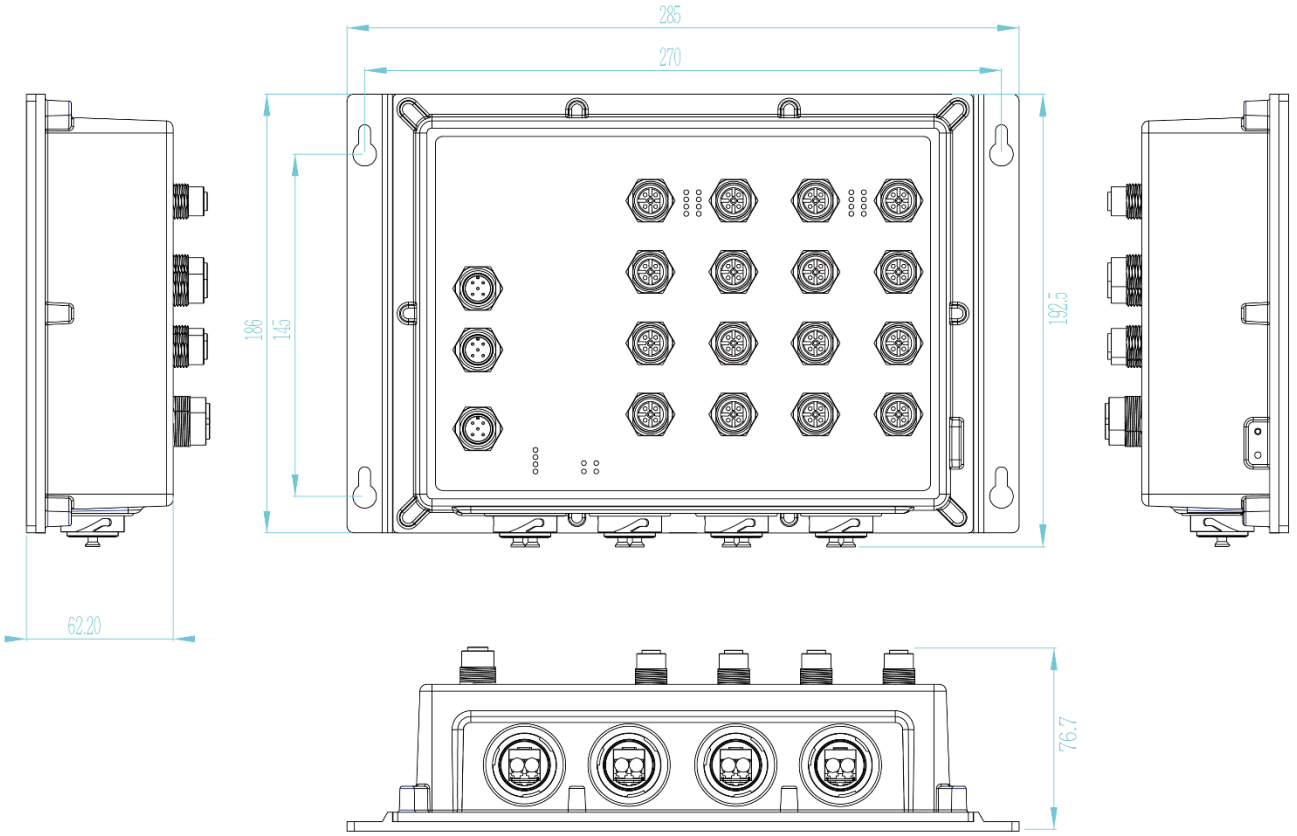
252 (W) x 179.5 (D) x 91 (H) mm




**IES-5416DF**

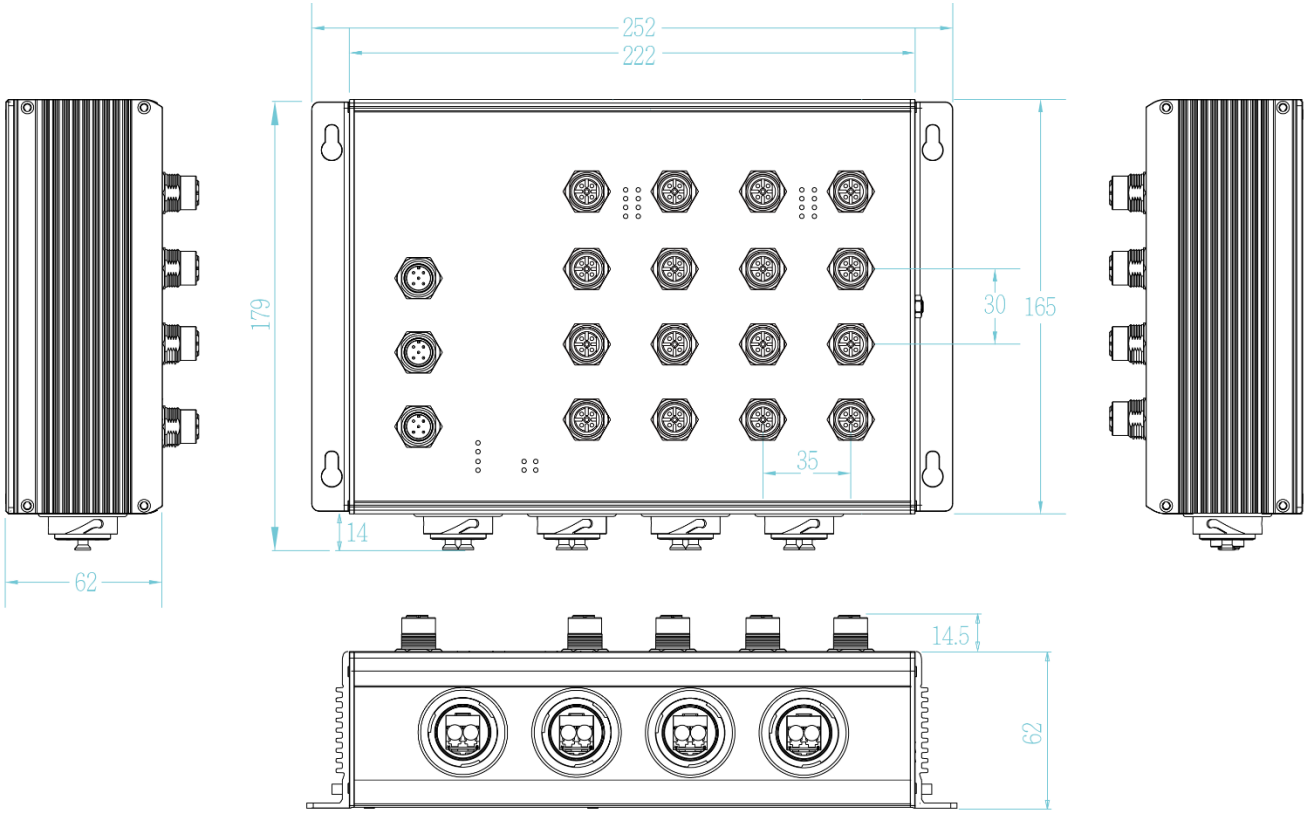
Aluminum case. IP-67,

285 (W) x 193 (D) x 91.2 (H) mm




Aluminum case. IP-54,

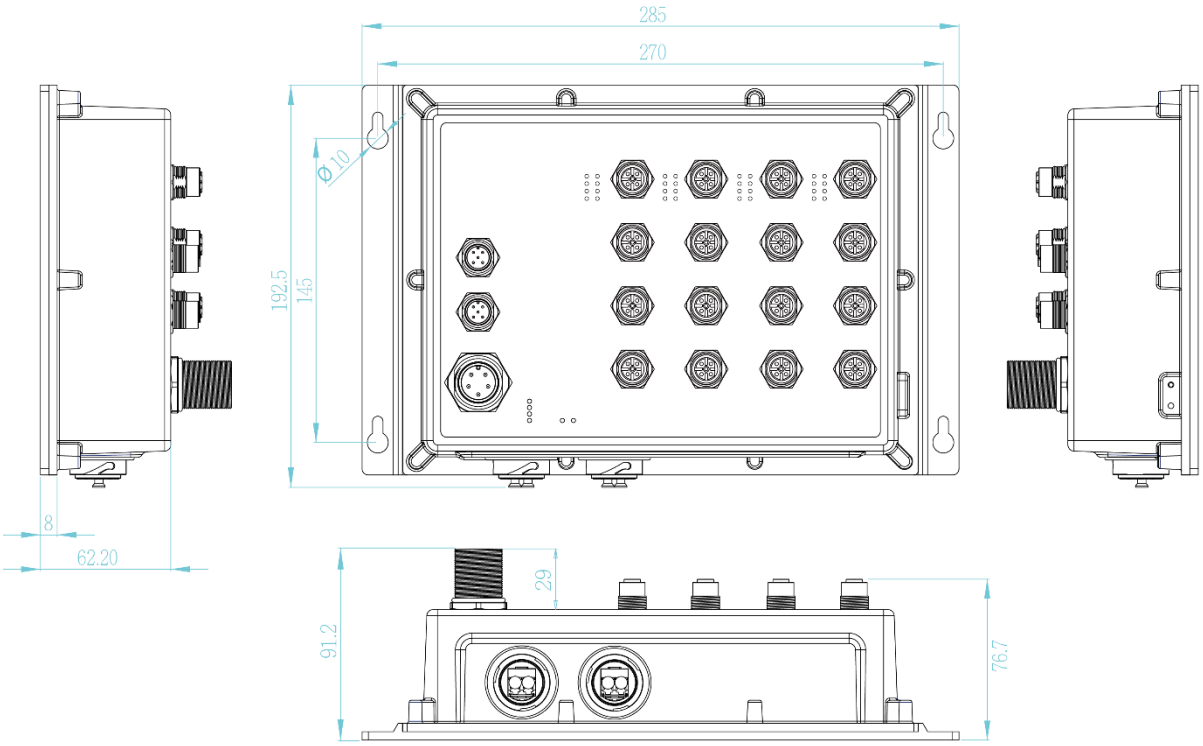
252 (W) x 179.5 (D) x 91 (H) mm



**IPES-5216DF**

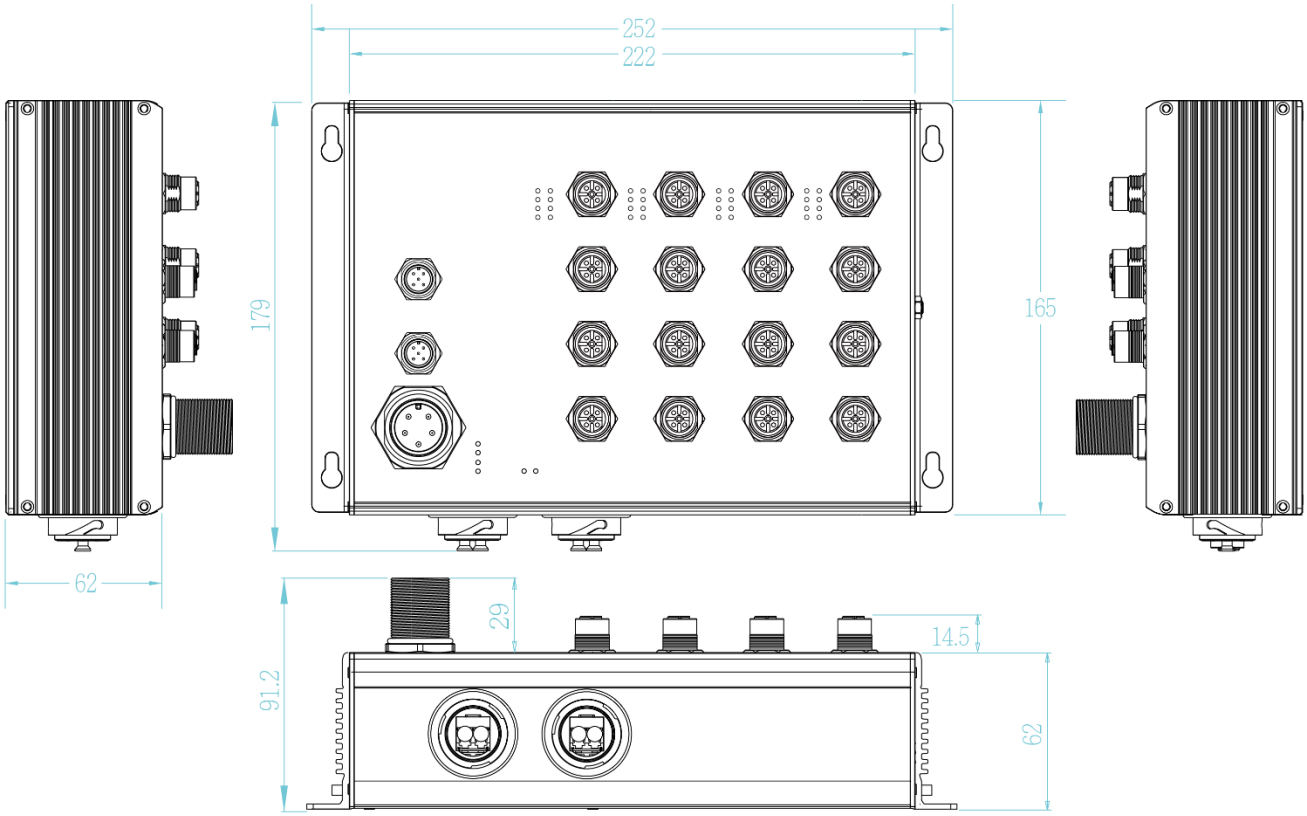
Aluminum case. IP-67,

285 (W) x 201.4 (D) x 84.4 (H) mm




Aluminum case. IP-54,

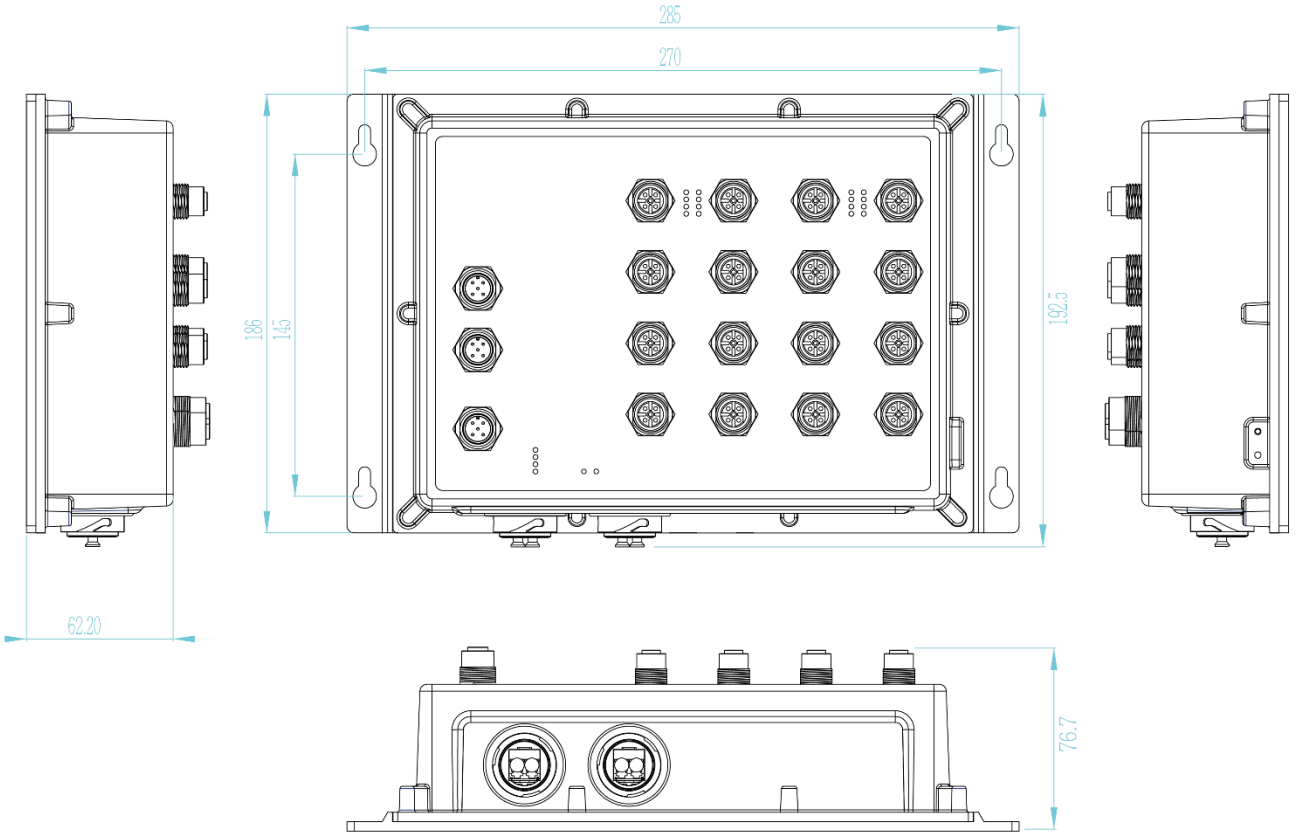
285 (W) x 201.4 (D) x 84.4 (H) mm




**IES-5216DF**

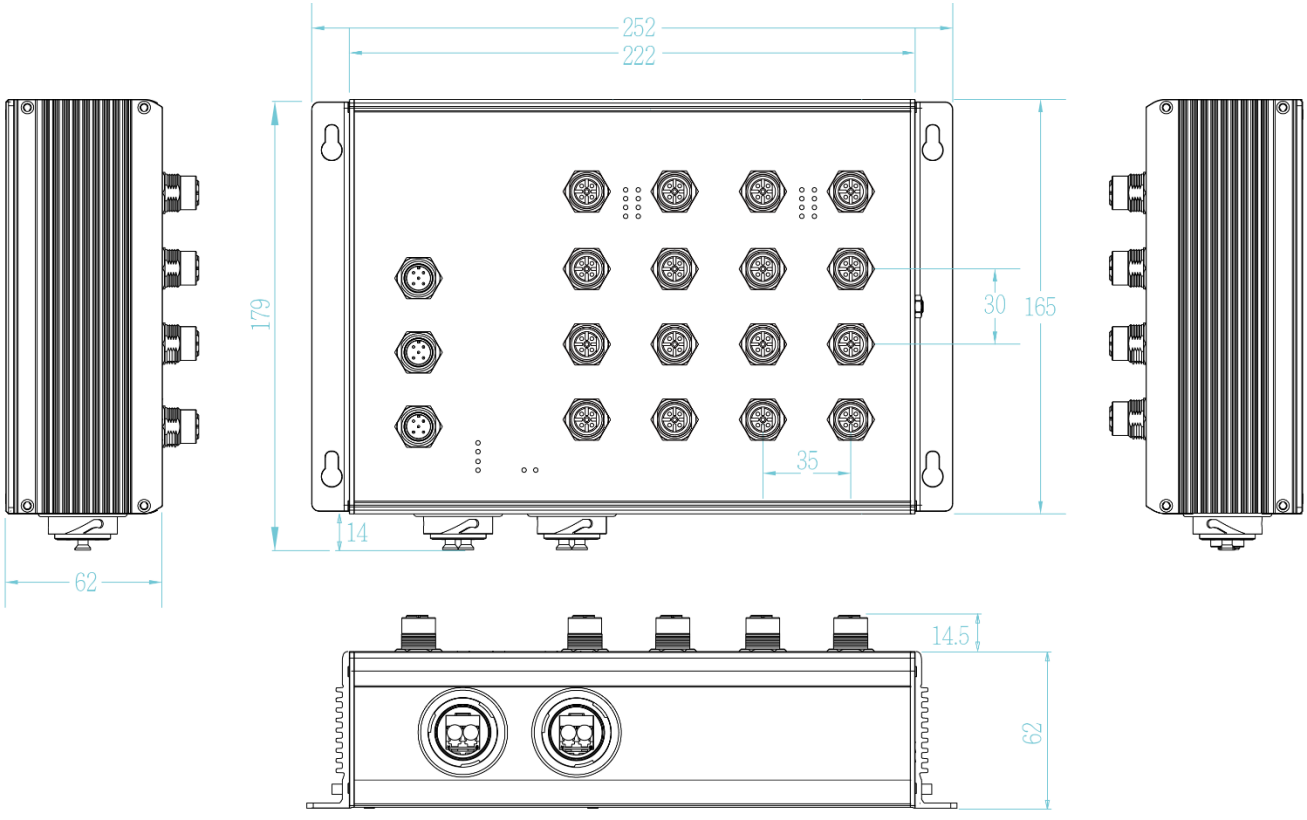
Aluminum case. IP-67,

285 (W) x 201.4 (D) x 84.4 (H) mm

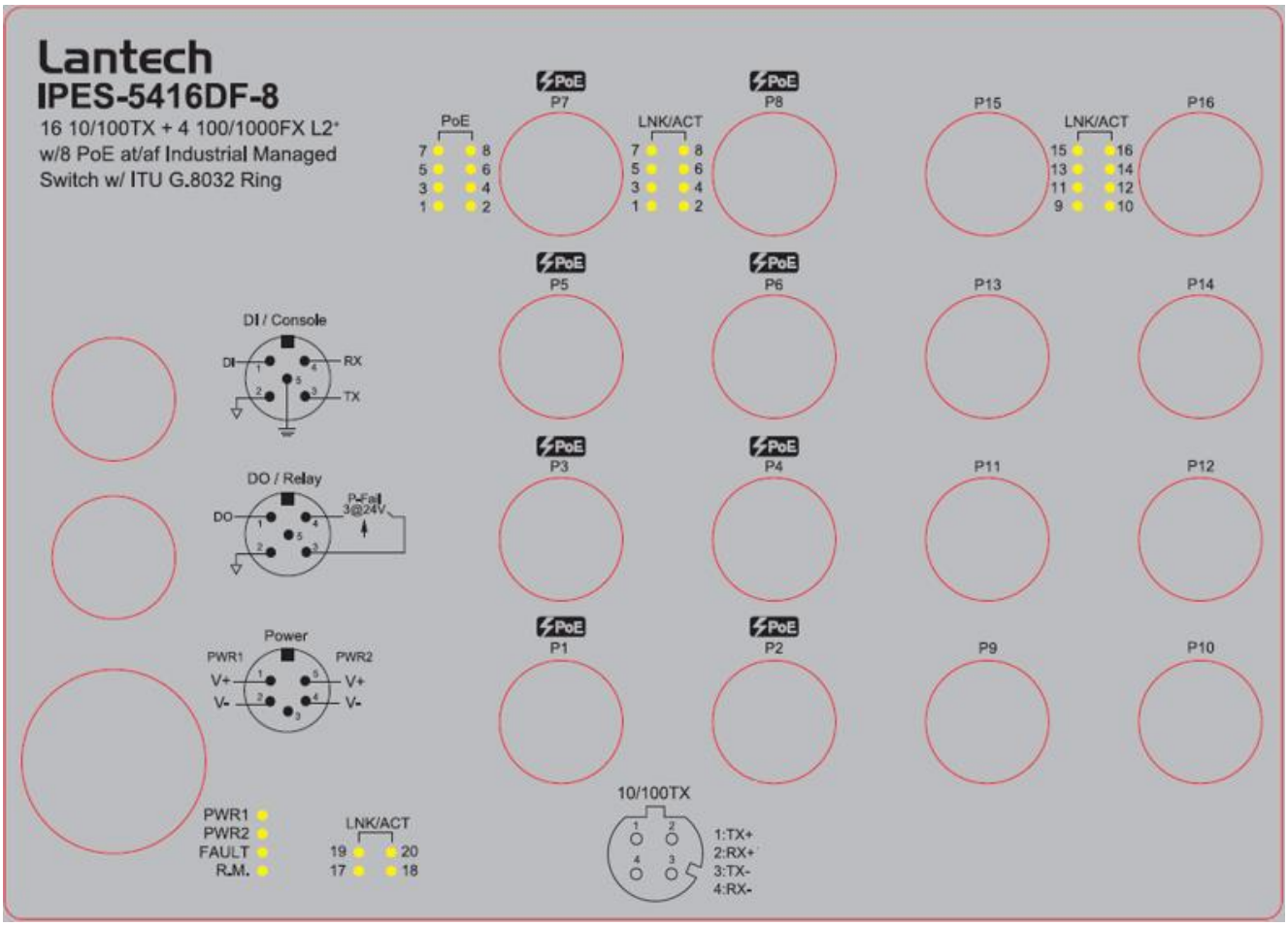



Aluminum case. IP-54,

285 (W) x 201.4 (D) x 84.4 (H) mm



Front panel of IPES-5416DF




## 2.2 IP Protection

The **IP Code**, **Ingress Protection Rating**, sometimes also interpreted as **International Protection Rating**, classifies and rates the degree of protection provided against the intrusion (including body parts such as hands and fingers), dust, accidental contact, and water in *mechanical casings* and with electrical enclosures. It is published by the International Electrotechnical Commission (IEC)

Solid particle protection

The first digit indicates the level of protection that the enclosure provides against access to hazardous parts (e.g., electrical conductors, moving parts) and the ingress of solid foreign objects.

| Level | Object size protected against | Effective against |
|---|---|---|
| **0** | — | No protection against contact and ingress of objects |
| **1** | >50 mm | Any large surface of the body, such as the back of a hand, but no protection against deliberate contact with a body part |
| **2** | >12.5 mm | Fingers or similar objects |
| **3** | >2.5 mm | Tools, thick wires, etc. |
| **4** | >1 mm | Most wires, screws, etc. |
| **5** | Dust protected | Ingress of dust is not entirely prevented, but it must not enter in sufficient quantity to interfere with the satisfactory operation of the equipment; complete protection against contact |
| **6** | Dust tight | No ingress of dust; complete protection against contact |

Liquid ingress protection

The second digit indicates the level of protection that the enclosure provides against harmful ingress of water.

| Level | Protected against | Testing for | Details |
|---|---|---|---|
| **0** | Not protected | — | — |

| | | | |
|---|---|---|---|
| **1** | Dripping water | Dripping water (vertically falling drops) shall have no harmful effect. | Test duration: 10 minutes<br>Water equivalent to 1 mm rainfall per minute |
| **2** | Dripping water when tilted up to 15° | Vertically dripping water shall have no harmful effect when the enclosure is tilted at an angle up to 15° from its normal position. | Test duration: 10 minutes<br>Water equivalent to 3 mm rainfall per minute |
| **3** | Spraying water | Water falling as a spray at any angle up to 60° from the vertical shall have no harmful effect. | Test duration: 5 minutes<br>Water volume: 0.7 litres per minute<br>Pressure: 80–100 kPa |
| **4** | Splashing of water | Water splashing against the enclosure from any direction shall have no harmful effect. | Test duration: 5 minutes<br>Water volume: 10 litres per minute<br>Pressure: 80–100 kPa |
| **5** | Water jets | Water projected by a nozzle (6.3 mm) against enclosure from any direction shall have no harmful effects. | Test duration: at least 15 minutes<br>Water volume: 12.5 litres per minute<br>Pressure: 30 kPa at distance of 3 m |
| **6** | Powerful water jets | Water projected in powerful jets (12.5 mm nozzle) against the enclosure from any direction shall have no harmful effects. | Test duration: at least 3 minutes<br>Water volume: 100 litres per minute<br>Pressure: 100 kPa at distance of 3 m |
| **7** | Immersion up to 1 m | Ingress of water in harmful quantity shall not be possible when the enclosure is immersed in | Test duration: 30 minutes<br>Immersion at depth of at least 1 m measured at bottom of device, and at least |

| | | | |
|---|---|---|---|
| | | water under defined conditions of pressure and time (up to 1 m of submersion). | 15 cm measured at top of device |
| **8** | Immersion beyond 1 m | The equipment is suitable for continuous immersion in water under conditions which shall be specified by the manufacturer. Normally, this will mean that the equipment is hermetically sealed. However, with certain types of equipment, it can mean that water can enter but only in such a manner that it produces no harmful effects. | Test duration: continuous immersion in water<br>Depth specified by manufacturer |
| **9** | Powerful high temperature water jets | Protected against close-range high pressure, high temperature spray downs. | — |

## 2.3 LED Indicators

The diagnostic LEDs that provide real-time information of system and optional status are located on the front panel of the industrial switch. The following table provides the description of the LED status and their meanings for the switch.

| LED | Color | Status | Meaning |
|---|---|---|---|
| **R.M** | Green | On | The switch unit is owner switch of ITU-Ring |

| | | | |
|---|---|---|---|
| | | Off | The switch is not owner switch |
| **PWR1** | Green | On | Power 1 is active |
| | | Off | Power 1 is inactive |
| **PWR2** | Green | On | Power 2 is active |
| | | Off | Power 2 is inactive |
| **FAULT** | Red | On | Power or port failure |
| | | Off | No failure |
| **P1 ~ P16** | Lnk/Act | On | A network device is detected. |
| | | Blinking | The port is transmitting or receiving packets from the TX device. |
| | | Off | No device attached |
| | PoE(1~8) | On | The port is operating in PoE mode.(IPES) |
| | | Off | The port is not operating in PoE mode.(IPES) |
| **P17 ~ P20 (5416DF)**<br>**P17 ~ P18 (5216DF)** | Lnk/Act | On | A network device is detected. |
| | | Blinking | The port is transmitting or receiving packets from the TX device. |
| | | Off | No device attached. |

# Chapter 3 Hardware Installation

## 3.1Hardware installation

3.1.1Unpack switch and check the accessory with packing list

3.1.2 Mount the switch on desired position

3.1.3 Connect the M23/M12 connector of power input.

- Voltage of Power Input

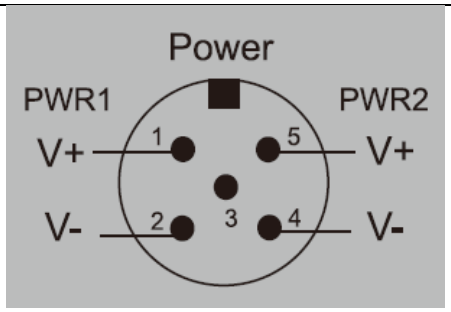
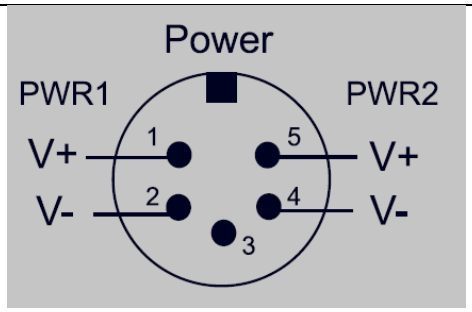
| | |
|---|---|
| Non-PoE model (5-pin M12 connector) | **12V model:** The power input voltage can be from 9V to 60VDC |
| | **72V model:** The power input voltage can be from 50.4V to 90VDC |
| | **110V model:** The power input voltage can be from 43V to 137.5VDC |
| | **WV model:** The power input voltage can be from 16.8V to 137.5VDC |
| PoE model (5-pin M23 connector) | **12V model:** The power input voltage can be from 9.5V to 56VDC to feed power on both the 802.3af and 802.3at standardized devices. |
| | **72V model:** The power input voltage can be from |

| | |
|---|---|
| | 50.4V to 90VDC to feed power on both 802.3af/at standardized devices. |
| | **110V model:**<br>The power input voltage can be from 43V to 137.5VDC to feed power on both 802.3af/at standardized devices. |

Make sure that the external power supply unit you use to provide the PoE voltage fulfils the following basic criteria:

- The output voltage of power supply must exceed 48VDC for 802.3af and 53VDC for 802.3at operation (*with IPES-5416DF-72V, only 72VDC can power both the 802.3af and 802.3at PD. **with IPES-5416DF-110V, only 110VDC can power both the 802.3af and 802.3at PD.)

- The power consumption can satisfy the total power request from all PD devices required.

| Non-PoE model (M12) | PoE model (M23) |
|---|---|
|  |  |



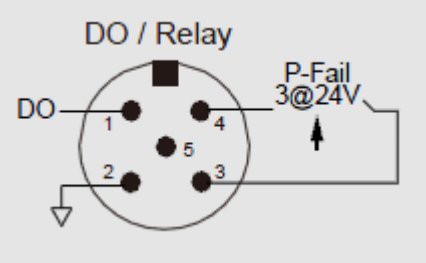
Pin assignment of Power input

■ Dual Power Input

The power input can be supported redundantly. The supply voltage is electrically isolated from the housing.

**Note:** With single power supply of the mains voltage, the device will

report a power failure. You can disable this power fail event via web browser.




Pin assignment of alarm relay

A break in contact is reported via the relay contact :

- The failure of at least one of the two supply voltages.
- The break link status of at least one switch port.

### 3.1.4 Fitting the device, grounding

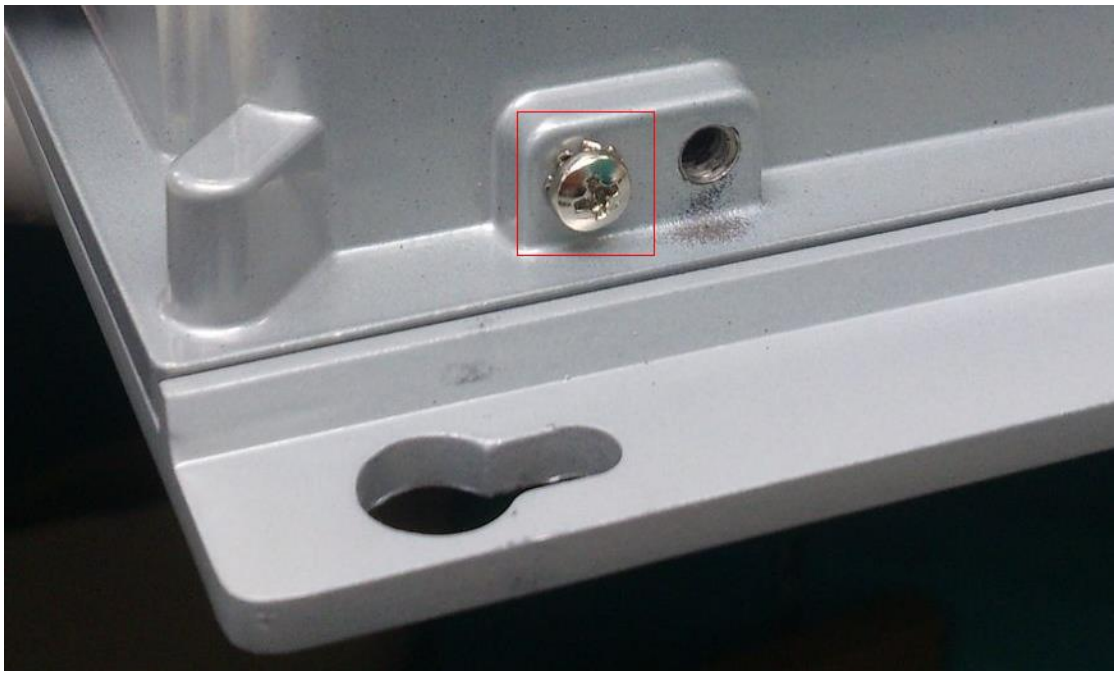
Install the system in a dry and clean area to protect the switch to get exposed with dirt.

Plug the connector to the power supply plug then turn on the power supply.

- **Ground**

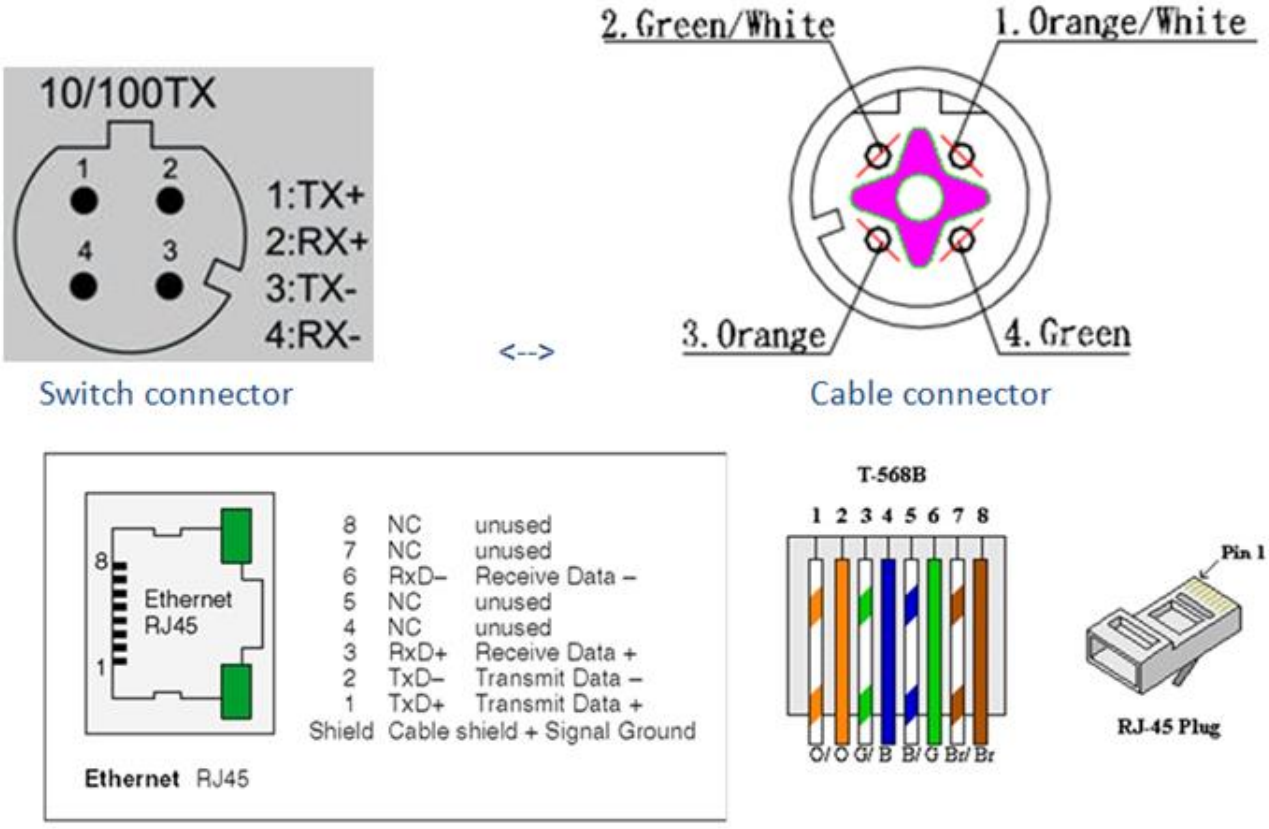
The chassis is grounded via a separate ground nut (M3).

Use toothed locking washers for a good electrical connection.



Ground screw

3.1.5 Connect the M12 connector with RJ-45 data cable, ports are not used shall be caped that comes with the package to insulate the surrounding.




Pin assignment of M12 10/100Tx network connector

3.1.6 Check the status of LED, make sure the switch was in working status.

**Note:**

- The protection class IP67/IP54 is only achieved when bolted together.
- The other components attaching to the system have to meet with the IP67/IP54 protection class in order to reach the whole system IP67/IP54 protection.
- Empty ports must be sealed with the protective caps supplied.

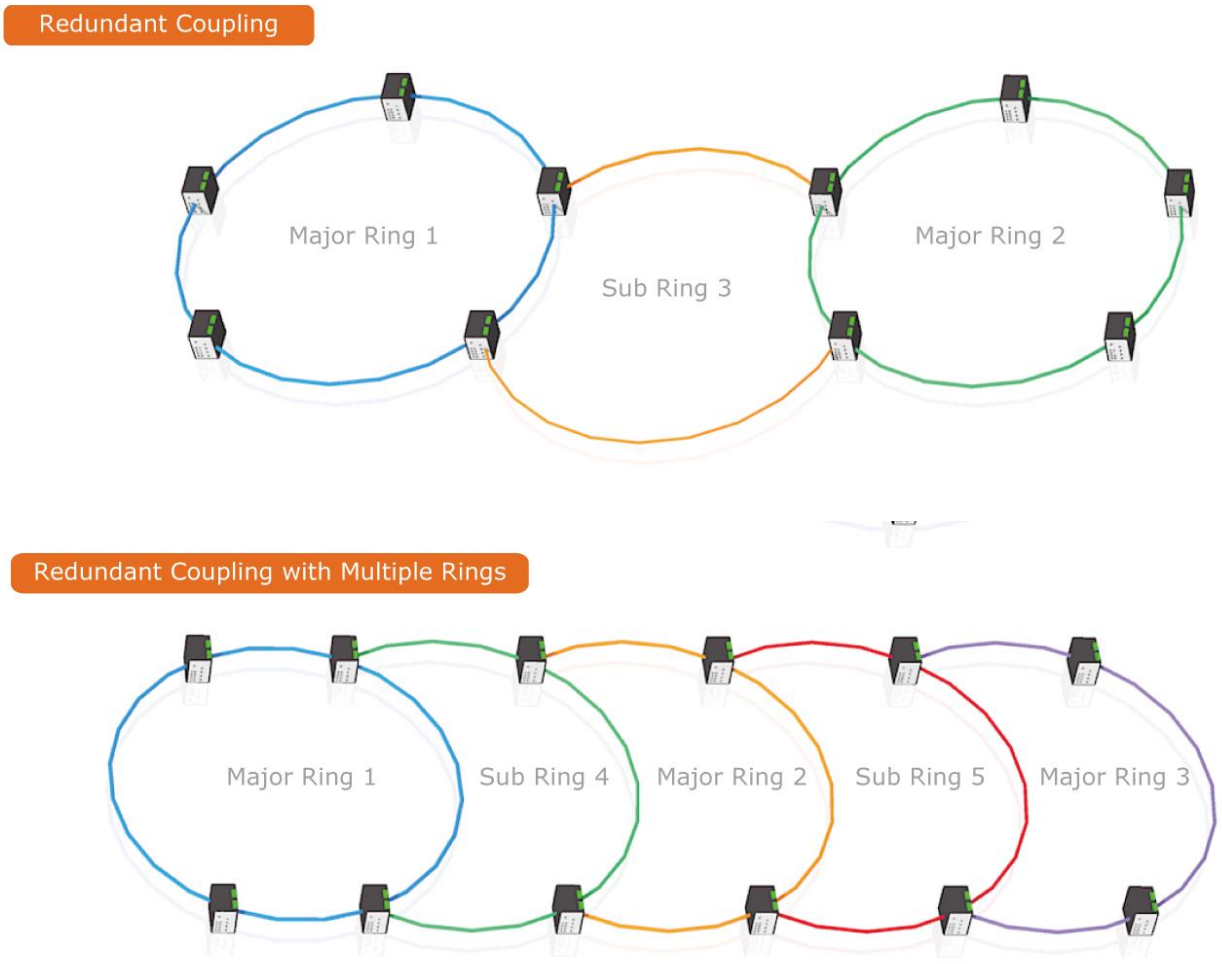
# Chapter 4 Network Application

## 4.1 ITU G.8032 Scheme

LANTECH G.8032 protocol is following ITU (International Telecommunication Unit) G.8032 v2 draft. The benefits of G.8032 are:

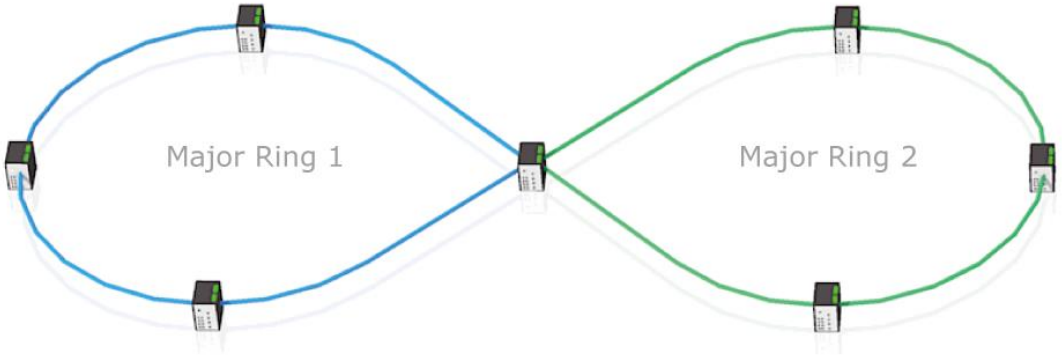
1. <50ms recovery time when failover
2. G.8032 has defined the protocol scheme, parameters, functions, test measures to be unified that the users can evaluate the possible network infrastructure without literally testing each brand in large scale.

## 4.2 Ring Coupling

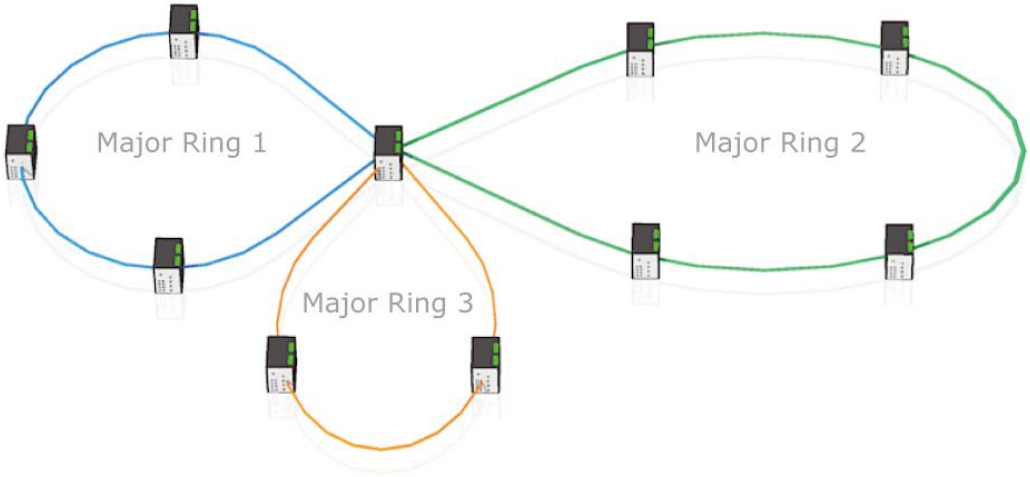


## 4.3 Multiple Rings

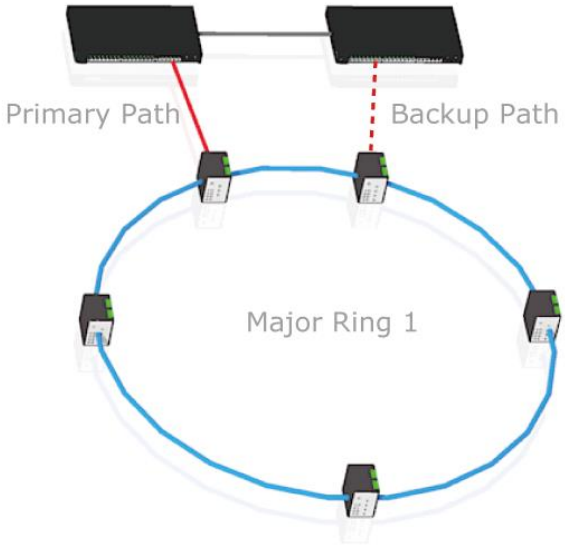
Dual Rings



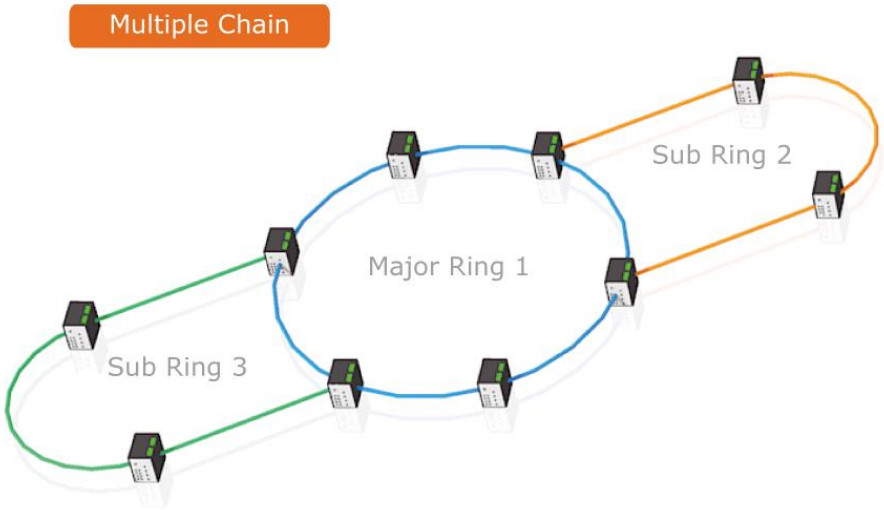

Multiple Rings



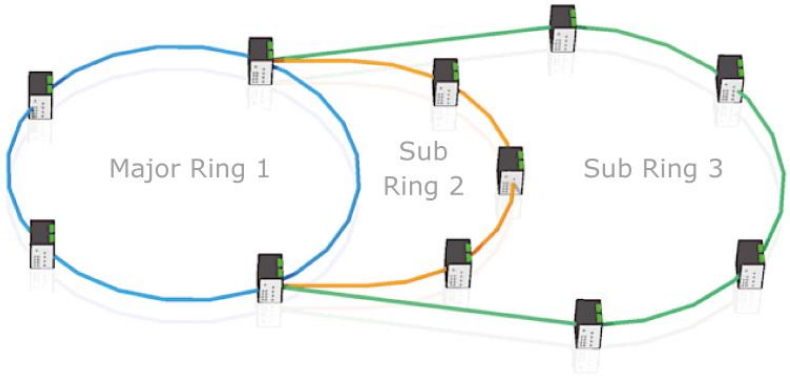
## 4.4 Dual Homing



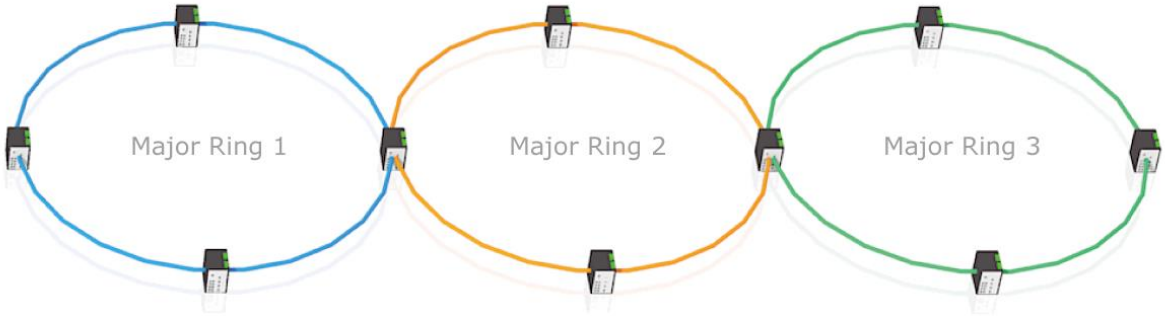

## 4.5 Chain



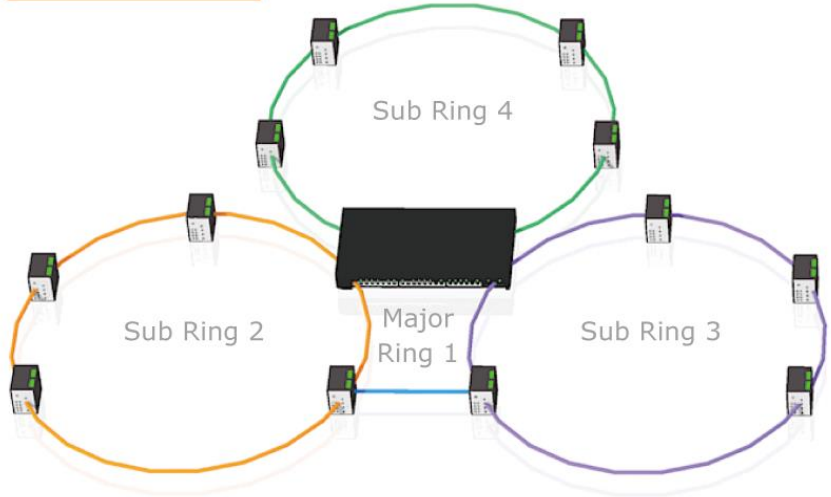
## Multiple Chain Share Common Ends




## Cascade Chain



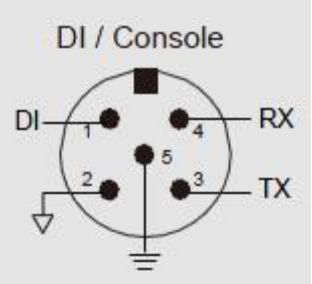

## Chain in Chain



# Chapter 5 Console Management

## 5.1 Connecting to the Console Port

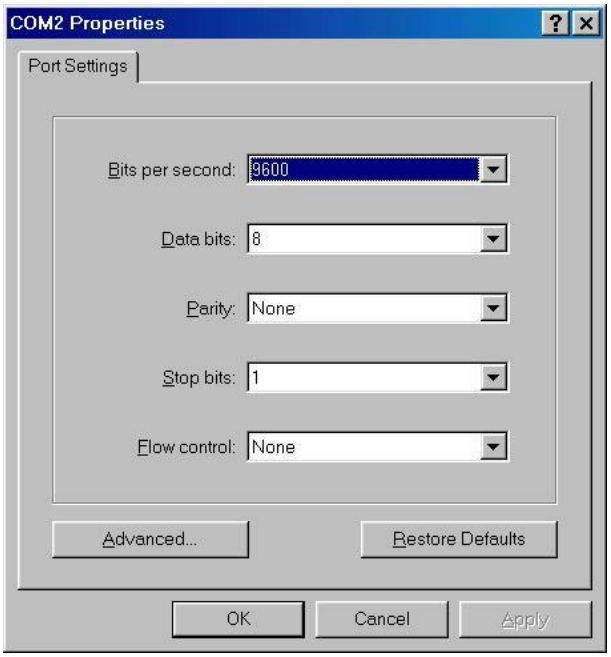
The supplied cable which one end is M12 5-pole connector and the other end is RS-232 connector. Attach the end of RS-232 connector to PC or terminal and the other end of M12 connector to the console port of the switch. The connected terminal or PC must support the terminal emulation program.




## 5.2 Login in the Console Interface

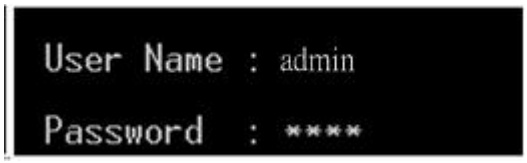
When the connection between Switch and PC is ready, turn on the PC and run a terminal emulation program or **Hyper Terminal** and configure its **communication parameters** to match the following default characteristics of the console port:

**Baud Rate:115200 bps**
**Data Bits: 8**
**Parity: none**
**Stop Bit: 1**
**Flow control: None**




The settings of communication parameters

Having finished the parameter settings, click '**OK**'. When the blank screen shows up, press Enter key to have the login prompt appears. Key in '**admin**' (default value) for both User name and Password (use **Enter** key to switch), then press Enter and the Main Menu of console management appears. Please see below figure for login screen.




Console login interface

## ==========Notice==========

For web-based management, please refer to our "Software Management Manual" at http://www.lantechcom.tw/global/eng/support-downloads.html